DECrouter 2000 Installation Procedures

Order No. AA-JH81A-TN

SUPERSESSION/UPDATE INFORMATION:	This is a new manual
OPERATING SYSTEM AND VERSION:	VAX/VMS V4.4 or later MicroVMS V4.4 or later ULTRIX-32 V1.2 or later ULTRIX-32m V1.2 or later
SOFTWARE VERSION:	DECrouter 2000 V1.0

digital™

First Printing, October 1987

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How to Use This Manual

Manual Objectives

This manual describes how to:

- Install the DECrouter 2000 software on to the load host.
- Configure the load host database, so that the software can be down-line loaded on to the DECrouter 2000.
- Configure the DECrouter 2000 permanent database.
- Load the DECrouter 2000.

Intended Audience

This manual is for system and network managers who are familiar with networking concepts and the DECnet products.

The system manager is responsible for installing and configuring the software on to one or more load hosts. The system manager is also responsible for checking that the software can load and dump. The network manager is responsible for configuring the DECrouter 2000.

The manual assumes that readers understand and have some experience of:

- Local Area Networks (LANs)
- Wide Area Networks (WANs)
- Installation of software products on VAX/VMS or ULTRIX systems

- DECnet-VAX (if using a VMS load host)
- DECnet-ULTRIX (if using an ULTRIX load host)

Structure of the Manual

The manual has 5 chapters and 3 appendixes.

VMS system managers should read Chapters 1 and 2, and refer to Appendixes A and C.

VMS network managers should read Chapters 1 and 3, and refer to Appendixes A and C.

ULTRIX system managers should read Chapters 1 and 4, and refer to Appendixes B and C.

ULTRIX network managers should read Chapters 1 and 5, and refer to Appendixes B and C.

Chapter 1 contains information you will need before installing the software.

Chapter 2 explains how to install the software on to a VMS load host.

Chapter 3 explains how to configure the VMS load host database and the DECrouter 2000 database. This chapter also explains how to load the DECrouter 2000.

Chapter 4 explains how to install the software on to an ULTRIX load host.

Chapter 5 explains how to configure the ULTRIX load host database and the DECrouter 2000 database. This chapter also explains how to load the DECrouter 2000.

Appendix A is an example of installing and configuring the software on a VMS host.

Appendix B is an example of installing and configuring the software on an ULTRIX host.

Appendix C lists the files installed for VMS and ULTRIX load hosts.

Associated Manuals

For more information on the DECrouter 2000, refer to:

- *DECrouter 2000 Problem Solving Guide*
- *DECrouter 2000 Management Guide*

You may also find the *Routing and Networking Overview* useful in explaining routing concepts and terminology.

All three of these manuals are in the same binder as this manual.

The following provide information about the hardware used with the DECrouter 2000 software:

- *Installing the DEC MicroServer*
- *DEC MicroServer Systems Configuration Card*

If a VAX/VMS system is being used as a load host, you are expected to be familiar with the following manuals:

- *VAX/VMS Networking Manual*
- *VAX/VMS Network Control Program Reference Manual*
- *Guide to VAX/VMS Software Installation*

If an ULTRIX system is being used as a load host, you are expected to be familiar with the following manuals:

- *ULTRIX-32 System Manager's Guide* or the *ULTRIX-32m System Manager's Guide*
- The DECnet-ULTRIX documentation set, in particular the *DECnet-ULTRIX Guide to Network Management* and the *DECnet-ULTRIX User's and Programmer's Guide*

Manual Conventions

<xxx> This one- to three-character symbol indicates that you press a key on the terminal. For example:

<RET> indicates the RETURN key

<ESC> indicates the ESCAPE key

<CTRL/*x*>	This symbol indicates that you press the CTRL key at the same time as you press another key; for example, <CTRL/C>, <CTRL/Y>, and so on.
Red print	indicates commands and data that you enter.
Italics	indicate variable information.

1
Installation Guidelines

1.1 Introduction

The installation procedure consists of the following steps:

1. Installing the distribution software on the load host(s)
2. Configuring the load host database
3. Configuring the DECrouter 2000 permanent database
4. Down-line loading the DECrouter 2000 software on to the DEC MicroServer hardware unit

The load host can be any VAX/VMS or ULTRIX Phase IV DECnet node and must be connected to the same Ethernet as the hardware unit.

If you use a VAX/VMS system as the load host, the system must be running V4.4 or later versions of VMS or MicroVMS. If you use an ULTRIX system as a load host, the system must be running at least V1.2 of ULTRIX-32 or ULTRIX-32m.

The load host is used to store the DECrouter 2000 software image which is down-line loaded on to the DECrouter 2000. The load host also stores the configuration database and is used to receive up-line dumps from the DECrouter 2000.

You are advised to install the DECrouter 2000 software on at least two load hosts. This means that you can still down-line load the image to the DECrouter 2000 and receive dumps when one load host is unavailable. To install the software on to a second load host, simply repeat the installation procedure.

If your load hosts are within a VAXcluster, refer to Section 2.3for details of how to use VAXcluster nodes as load hosts.

1.2 Pre-Installation Preparations

Before you install the DECrouter 2000 software on the load host, you need to ensure that there is enough free disk space for the DECrouter 2000 image and configuration file. You also need to ensure that there is enough room for the load host system to receive up-line dumps from the DECrouter 2000.

Table 1-1: Disk Space Required for the DECrouter 2000 Software

	VAX/VMS System	ULTRIX System
Installation (per DECrouter 2000)	2000 blocks	1024K bytes
Up-line Dumps (per dump)	5000 blocks	2560K bytes

1.2.1 Distribution Kits

For MicroVAX load hosts, the DECrouter 2000 software is installed from a TK50 cassette or from RX50 floppies. For VAX load hosts, magnetic tape is used for installing the DECrouter 2000 software.

Table 1-2: Media Used to Install the DECrouter 2000 Software

Media type	Number
TK50s	1
Magnetic tapes	1
RX50s	4

Before you install the software on to the load host, complete Table 1-3. During the installation, you will need to refer to this table for information about your load system and the DECrouter 2000. You will also need to refer to the *DEC MicroServer Systems Configuration Card* which is situated on the front of the DEC MicroServer hardware unit.

If there is a default answer for any question asked during the installation, the answer will be given in square brackets. So, if the default password is DECNET, it will appear as [DECNET].

Table 1-3: Pre-Installation Information

Ethernet address
DECnet address
DECnet node name
Load host node name(s)
Load host service circuit name(s)

The Ethernet address is the physical address of the DEC MicroServer hardware unit, which can be found on a label on the rear of the unit. The Ethernet address is also listed on the *DEC MicroServer Systems Configuration Card* which is attached to the front of the DEC MicroServer hardware unit. The DECnet address is the address assigned to the DECrouter 2000, and the DECnet node name is its node name. The load host node names are the names of the nodes that will down-line load the DECrouter 2000.

DIGITAL suggests that you complete the above table, and then complete the required information about load hosts on the *DEC MicroServer Systems Configuration Card* once the DECrouter 2000 installation has been successfully completed.

Refer to Appendix C for a list of those files which are installed on to the load host.

PART 1

USING A VMS LOAD HOST

2
Installation Procedures for VAX/VMS

This chapter explains how to install the DECrouter 2000 software on to a VAX/VMS load host. During the installation you will need the information that you supplied in Table 1-3.

2.1 Installing the DECrouter 2000 Software

2.1.1 Starting the Installation

To install the DECrouter 2000 software, carry out the following procedure:

Log in to the system manager's privileged account. Check you have set default to the disk that is to receive the DECrouter 2000 software; typically, this is the system disk (with the logical name SYS$SYSDEVICE). Check that the disk has enough free space for the DECrouter 2000 image and configuration file to be installed. Remember to include enough space for up-line dumps from the DECrouter 2000. Refer to Table 1-1 for details of how much free disk space you need on your system to install the DECrouter 2000 software.

To start the installation procedure, enter the following commands:

```
$ SET DEFAULT SYS$UPDATE
$ @VMSINSTAL ROU010 device-identifier OPTIONS N
```

where *device-identifier* is the name of the device that the distribution kit is mounted on. The format for the device name is *ddcu:* where *dd* is the device code, *c* is the controller letter, and *u* is the unit number. For example: if you wish to install from MUA0: answer MUA0:

Using the OPTIONS N facility allows you to print and/or read the Release Notes.

The procedure displays:

```
        VAX/VMS Software Product Installation Procedure V4.4

It is date at time

Enter a question mark (?) at any time for help.
```

If DECnet is currently running on your system, the procedure warns you with the following message:

```
%VMSINSTAL-W-DECNET, Your DECnet network is up and running.
* Do you want to continue anyway [NO]?
```

As you do not have to turn DECnet off to install the software, you may answer YES to this question. The procedure continues with:

```
* Are you satisfied with the backup of your system disk [YES]?
```

Make sure you have a good backup copy of the disk, as the installation will write to the system disk. If your system disk has not been backed up, answer NO to this question. If you answer NO, the procedure exits, and the DECrouter 2000 software will not be installed. When you have backed up your system disk, you can start the installation procedure again.

Answer YES when you have a good backup copy of the disk.

You are now asked to mount the first volume:

```
Please mount the first volume of the set on device-identifier
Are you ready?
```

Enter YES, and a message is displayed confirming that the media is mounted. The procedure then displays the following messages:

```
The following products will be processed:

   ROU V1.0

Beginning installation of ROU V1.0 at time

%VMSINSTAL-I-RESTORE, Restoring product saveset A...
```

You will then be asked about the Release Notes.

2.1.2 Release Notes

The procedure displays the options for printing and displaying the Release Notes. **You are recommended to print and read the Release Notes before continuing the installation.**

```
Release Notes Options:

1. Display release notes

2. Print release notes

3. Both 1 and 2

* Select option [3]:
```

Select one of these options. DIGITAL recommends that you choose Option 2. If you select Option 1, the following is displayed:

```
VMI$COMMON:[SYSUPD.DECSERVER]ROU010.RELEASE_NOTES;1
```

The Release Notes are displayed on your terminal and will start scrolling on your screen.

If you select Option 2, you are asked on which queue you wish the file to be printed:

```
* Queue name [SYS$PRINT]:
```

Enter <RET> or specify another print queue.

If you select Option 3, you are asked on which queue you wish the file to be printed and then the Release Notes will be displayed on your terminal.

When the Release Notes have been queued to a printer and/or displayed on your terminal, the procedure asks:

```
* Do you want to continue the installation [N]?
```

If you enter <RET>, you can stop the procedure and read the Release Notes. If you do this, the following message is displayed:

```
VMSINSTAL procedure done at hh:mm
```

While reading the Release Notes, check for any issues that are likely to affect the installation of the DECrouter 2000 software. The VMSINSTAL procedure creates a file for the Release Notes called ROU010.RELEASE_NOTES in the SYS$COMMON:[DECSERVER] directory once this directory has been created. The Release Notes are also copied to the SYS$HELP directory and the following message is displayed:

```
%VMSINSTAL-I-RELMOVED, The products release notes have been successfully moved
to SYS$HELP.
```

If you stop VMSINSTAL to read the Release Notes, restart the procedure by entering the following command:

```
$ @VMSINSTAL ROU010 device-identifier
```

2.1.3 Tailoring the Installation

If you do not stop VMSINSTAL, or if you have restarted the procedure, VMSINSTAL will continue to install the DECrouter 2000 software.

The procedure asks:

```
* Do you want to purge files replaced by this installation [YES]?
```

Answer YES if you wish to purge files from any previous installations of the DECrouter 2000 software. The procedure then asks:

```
Do you want the TRACE utility [YES]?
```

Answer YES if you wish to install the TRACE utility. Refer to the *DECrouter 2000 Problem Solving Guide* for details of this utility.

The installation procedure continues by copying the contents of the distribution volume to a subdirectory in SYS$UPDATE.

NOTE

If you are installing the DECrouter 2000 software from floppy disks, you will be instructed to remove one distribution volume and insert the next volume into the device as required.

The procedure then copies the distribution files from SYS$UPDATE to their respective directories. (See Appendix C for details of which files are installed into which directories.) You may if you wish remove the distribution media from the device at this stage.

If you decide to cancel the installation of the DECrouter 2000 software at any time by entering <CTRL/Y>, the following is displayed after a short time delay:

```
%VMSINSTAL-F-CTRLY, Installation canceled via CTRL/Y.
%VMSINSTAL-F-UNEXPECTED, Installation terminated due to unexpected event.

                    VMSINSTAL procedure done at hh:mm
```

If you enter <CTRL/Y> after the information message that the files are being moved to the target directories, your system will have some new and (if previously installed) some old DECrouter 2000 files. Therefore, you should reinstall the product.

The procedure then checks the definition for the system logical, MOM$LOAD. If you have already defined MOM$LOAD, the procedure asks if you wish to redefine MOM$LOAD now, and if so, will automatically redefine the logical name for you.

If MOM$LOAD is already correctly defined, the question is not asked. The next stages of the installation allow you to modify the DECrouter 2000 software for your system. The procedure displays the following messages.

```
The installation is now complete. After exiting from VMSINSTAL, do the
following:

1. If the definition for MOM$LOAD in the system start-up file does not
   contain SYS$SYSROOT:[DECSERVER], you must edit your system start-up file
   so that it defines the logical MOM$LOAD as a search string with a value
   equal to itself and the element SYS$SYSROOT:[DECSERVER]. For example:

   DEFINE/SYSTEM/EXEC/NAME_ATTRIBUTE=NO_ALIAS/NOLOG MOM$LOAD -
   "current-search-string",SYS$SYSROOT:[DECSERVER]

   This command allows the location of the DECrouter image to be defined
   each time the system is rebooted, so the system will load correctly.
```

2. Configure your DECrouter 2000 into the load host's database. Execute the command procedure called ROUCONFIG.COM which is in the SYS$SYSROOT:[DECSERVER] directory. If you have already executed this procedure from previous installations, you only need to configure any additional DECrouter units. All previously defined DECrouter units will still be configured within the load host's database. Refer to Chapter 3 of the DECrouter 2000 Installation Procedures for further details.

3. Set up the DECrouter 2000 permanent database before powering up the hardware. Execute the command procedure called ROUSETUP.COM which is in the SYS$SYSROOT:[DECSERVER] directory. ROUSETUP.COM generates an ICP which checks that the DECrouter 2000 is fully operational. Refer to Chapter 3 of the DECrouter 2000 Installation Procedures for further details.

   If you wish to modify the DECrouter 2000 database for your specific networking requirements, execute the ROUPERM.EXE program which is in the SYS$SYSTEM directory. This program is described in the DECrouter 2000 Management Guide.

4. REMINDER: The release notes for the DECrouter 2000 are in a file called ROU010.RELEASE_NOTES which is in the SYS$SYSROOT:[DECSERVER] directory.

If you have requested the TRACE utility, the following message is also displayed.

5. A command file SYS$MANAGER:NETTRACEINSTALL.COM has been created to install the TRACE utility. Edit your system start-up file to execute this file each time your system is booted.

```
%VMSINSTAL-I-MOVEFILES, Files will now be moved to their target directories...

                    Installation of ROU V1.0 completed at time

                        VMSINSTAL procedure done at time
```

Once you have edited your start-up procedure, run the configuration procedures, ROUCONFIG.COM to configure the load host's database and ROUSETUP.COM to configure the DECrouter 2000's permanent database. Refer to Chapter 3 for details of these procedures.

2.2 Installing on Multiple Load Hosts

You are advised to install the DECrouter 2000 software on to at least one other load host. The second load host can down-line load the software to the DECrouter 2000 if the first load host is not available. The second load host can also be used to receive

up-line dumps from the DECrouter 2000. You can use any VAX/VMS Phase IV DECnet node as a load host provided the node is connected to the same Ethernet as the hardware unit, and is running at least V4.4 of VAX/VMS or MicroVMS.

To install the DECrouter 2000 software on to one or more additional load hosts, repeat the installation procedure given in Section 2.1.

2.3 Installing on a VAXcluster

If you install the DECrouter 2000 software on to a node within a VAXcluster, the image will be copied to the SYS$COMMON area. In order to down-line load and up-line dump the DECrouter 2000 from the VAXcluster, you should run ROUCONFIG on one node within the VAXcluster. You should then re-run ROUCONFIG with the RESTORE option on the other VAXcluster nodes that you wish to use as load hosts for your DECrouter 2000. Refer to Section 3.1 for details.

Remember to redefine MOM$LOAD on each node you are using as a load host within the VAXcluster.

3
Configuring the Databases for VMS Load Hosts

This chapter describes the configuration procedure for:

- The VMS load host database
- The DECrouter 2000 permanent database

The chapter also explains how to load the DECrouter 2000.

The load host database contains information on the DECrouter 2000s that are to use the load host for down-line loading the DECrouter 2000 software. You need to configure the database before you can down-line load the DECrouter 2000 software.

The DECrouter 2000 permanent database contains the information required for the DECrouter 2000 to communicate with other nodes in the network.

After you have installed the software on to the load host, you should first run ROUCONFIG.COM to set up the load host database, and then run ROUSETUP.COM to set up the DECrouter 2000's permanent database. Refer to Section 3.1 for details of ROUCONFIG.COM, and refer to Section 3.2 for details of ROUSETUP.COM.

NOTE

You must not load the DECrouter 2000 until you have run these two command procedures. If you load the DECrouter 2000 before you have set up the databases, the DECrouter 2000 may attempt to use an incorrect configuration which could disrupt normal network operation. Refer to Section 3.3 for details of how to load the DECrouter 2000.

3.1 Configuring the Load Host Database

This configuration process is controlled by a menu-driven procedure called ROUCONFIG.COM which allows you to define, modify and delete entries about DECrouter 2000's in the load host's database.

The ROUCONFIG.COM file is copied to the SYS$SYSROOT:[DECSERVER] directory during the installation procedure.

The ROUCONFIG procedure allows you to:

- List the DECrouter 2000s defined in the load host database.
- Add an entry for a new DECrouter 2000 in the load host database which will identify the DECrouter 2000 on the Ethernet.
- Swap an existing DECrouter 2000 for a new one. If you swap a DECrouter 2000, all the original DECrouter 2000 characteristics are retained, but the Ethernet address of the new unit is substituted for the original one.
- Delete an entry for a DECrouter 2000 from the load host database. When you delete an entry, the load host no longer recognizes the DECrouter 2000, so is no longer a load host for that DECrouter 2000. Database entries are deleted when the network is reconfigured or when you assign a DECrouter 2000 to another load host.
- Restore existing DECrouter 2000s to your DECnet load database. This copies DECrouter 2000 entries from the load host database to the DECnet load database, so reconfiguring the DECnet load database. This is useful when you copy your local DECnet database from a central DECnet database which does not contain entries for the DECrouter 2000s.

ROUCONFIG modifies the following databases:

1. The load host database (containing information about the DECrouter 2000s) which is displayed when you select the List option from the menu. This database is stored in the file called ROUCONFIG.DAT in the SYS$COMMON:[DECSERVER] directory.
2. The volatile DECnet load host database.
3. The permanent DECnet load host database.

During the ROUCONFIG.COM procedure, information is sometimes transferred from the load host database to the DECnet database. ROUCONFIG keeps these two databases synchronized.

ROUCONFIG enables the service circuit that will be used to down-line load the DECrouter 2000 software from the load host to the DECrouter 2000.

3.1.1 Preparation for the Configuration Procedure

Before you run the ROUCONFIG.COM procedure, perform the following checks:

1. Ensure that DECnet is running on your load host node, and that NCP (the Network Control Program) has been installed.
2. Ensure that you know the DECnet node name and DECnet node address for each DECrouter 2000 you want to add to the database. The DECnet node name and address can be found on the *DEC MicroServer Systems Configuration Card* on the front of the hardware unit and in Table 1-3 in this manual.
3. Ensure that you know the Ethernet address of each DECrouter 2000 you want to add to the database. The Ethernet address can be found on the back of the hardware unit, on the *DEC MicroServer Systems Configuration Card* on the front of the hardware unit, and in Table 1-3 in this manual.

3.1.2 Running ROUCONFIG

ROUCONFIG is an interactive, menu-driven procedure. When the menu is displayed, select an option and enter <RET>. You can obtain HELP by entering a ?. When you have finished answering the questions on a selected option, the program returns you to the menu.

If you want to exit from an option without making any changes, enter <CTRL/Z> and the program returns you to the menu. Enter <CTRL/Z> at the menu to exit from the procedure.

If you have selected the Add, Delete or Swap options, NCP messages may be displayed when you have completed the option. If an error message is displayed, the operation may not have been successful. Refer to the *VAX/VMS System Messages and Recovery Procedures Reference Manual* for details of these messages.

If you run ROUCONFIG on a single system, the software must already be installed on that load host. If your load host is a member of a VAXcluster, the distribution software can be installed on any node within the VAXcluster - not necessarily the node on which you are running the procedure.

NOTE

If you have installed the DECrouter 2000 software on to more than one load host, you must run ROUCONFIG for each load host. First run ROUCONFIG on one load host, and then re-run ROUCONFIG with the RESTORE parameter on the other load hosts.

Log into the system account, or any account with OPER and SYSPRV privileges, and enter the following commands:

```
$ SET DEFAULT SYS$SYSROOT:[DECSERVER]
$ @ROUCONFIG
```

ROUCONFIG checks that DECnet is running. If DECnet is down, a warning message is displayed and the procedure exits. If this happens, start DECnet before executing the procedure again.

If the data file (called ROUCONFIG.DAT) does not exist, the procedure creates the file and displays the following message:

```
The database file: ROUCONFIG.DAT could not be found, a new file will be created for you.
```

You are then reminded that each DECrouter 2000 must have a unique DECnet node name and DECnet node address. The procedure asks if you want to continue or exit as follows:

```
Press <RET> to start, or CTRL/Z to exit.
```

If you press <RET>, ROUCONFIG displays the following:

```
                DECrouter Configuration Procedure


                      Menu of Options

                   1 - List known DECrouters

                   2 - Add a DECrouter

                   3 - Swap an existing DECrouter

                   4 - Delete an existing DECrouter

                   5 - Restore existing DECrouters

                 CTRL/Z - Exit from this procedure

Your choice:
```

Select the number that corresponds to the option you want and press <RET>. Sections 3.1.2.1 to 3.1.2.5 describe the options.

3.1.2.1 List Known DECrouters (Option 1) — If you select this option, the contents of the ROUCONFIG.DAT file is displayed as seven columns.

For example:

```
DECnet  DECnet Router Service
Address Node   Type   Circuit Ethernet Address  Load File  Dump File
------- ------ ------ ------- -----------------  ---------  ---------

12.1001 KANGA  DR2000 UNA-0   08-00-2B-02-CC-24 ROU010.SYS ROUKANGA.DMP
12.1002 KOALA  DR2000 UNA-0   08-00-2B-02-AA-23 ROU010.SYS ROUKOALA.DMP

Total of 2 DECrouter(s) defined.
```

The display shows information about the load host database including the names of the load and dump files used by the database.

A DECrouter 2000 dumps its memory into a DECrouter 2000 dump file either as a result of a failure or in response to a request by the network manager. This file can be used for diagnosing any problems that may arise when using a DECrouter 2000. If a

DECrouter 2000 repeatedly crashes and an up-line dump is produced, copy the dump to a suitable form of media and send it with a Software Performance Report (SPR) to DIGITAL. Refer to the *DECrouter 2000 Problem Solving Guide* for details of how to submit an SPR.

The naming convention used for the load and dump files is as follows:

ROU010.SYS
ROU*router*.DMP

where *router* is the node name of the DECrouter 2000.

3.1.2.2 Add a DECrouter (Option 2) — If you select this option, you can add a new entry to the load host database. When you define a new entry you must supply:

1. The DECrouter type
2. A unique DECnet node name for the DECrouter 2000
3. A unique DECnet node address for the DECrouter 2000
4. The Ethernet address of the DECrouter 2000
5. The name of the load host's service circuit which will be used to down-line load the DECrouter 2000

The DECrouter 2000's DECnet node name and address, its Ethernet address and the name of the load host's service circuit can be found in Table 1-3 in this manual.

You will be prompted to supply the above information as follows.

```
DECrouter type (DR200, DR2000, X25ROU):
```

Specify DR2000 for a DECrouter 2000, which allows you to use up to four synchronous lines. If you specify DR200, you can use the DECrouter 200 which has up to eight asynchronous lines. Refer to the DECrouter 200 documentation for details of this product. If you specify X25ROU, you can use the X25router which has up to four synchronous lines which can be used for DECnet and X.25 links. Refer to the X25router documentation for details of this product.

```
DECnet node name for unit:
```

Specify the DECnet node name for the DECrouter 2000. This node name consists of up to six alphanumeric characters (one of which must be a letter). The name must be unique for your DECnet network.

DECnet node address for unit:

Specify the DECnet node address for the DECrouter 2000. This is a decimal number from 1 to 1023 and must be unique for your DECnet network. If your network is divided into areas, include the area number within the address (the area address is inserted in front of the node address). For example, if an address is 12.1001, 12 is the area number and 1001 is the node number. If you omit the area number, the area number of the current load host is used as a default.

Ethernet address for unit (nn-nn-nn-nn-nn-nn):

Specify the Ethernet address of the DECrouter 2000. This address is situated on the *DEC MicroServer Systems Configuration Card* which is on the front of the hardware unit. If the address is not on the card, it can be found on a label on the back of the hardware unit. Enter the Ethernet address as six pairs of hexadecimal digits, with a hyphen separating each pair. For example: 08-00-2B-02-AA-23

DECnet Service Circuit-ID [*default-id*]:

Specify the service circuit for your load host's Ethernet controller type as follows:

- UNA-*n* for DEUNA or DELUA
- QNA-*n* for DEQNA
- BNT-*n* for DEBNT
- BNA-*n* for DEBNA
- SVA-*n* for DESVA

were *n* is an integer.

Whenever you run this configuration procedure, you will be asked for the service circuit-ID. The first time you are asked for the circuit-ID, the default response will be determined by the processor type of the VAX/VMS load host. If you specify a different service circuit-ID, this new circuit-ID becomes the new default. Table 3-1 lists the default values for each CPU type.

Table 3-1: CPU Type and Service Circuits

CPU Type	Default Service Circuit-ID
VAX-11/725, 730, 750, 780, 782, 785	UNA-0
VAX 8200, 8250, 8300, 8350, 8500, 8530, 8550, 8600, 8650, 8700, 8800	UNA-0
MicroVAX I, MicroVAX II, VAXstation I, VAXstation II	QNA-0
MicroVAX 2000 VAXstation 2000	SVA-0

Once you have specified the service circuit-ID, ROUCONFIG adds the new entry to the database, and sets SERVICE ENABLED on the circuit. This will allow the load host to down-line load the DECrouter 2000 software image to the DECrouter 2000.

NOTE

When ROUCONFIG sets SERVICE ENABLED on the circuit, the circuit may be turned off and then turned on again which may cause events to be logged.

If a DECnet NCP error message is displayed while you are adding a DECrouter 2000 to the database, the entry will be added to the ROUCONFIG.DAT file, but will not be added to the DECnet database. Therefore, you should immediately use Option 4 to delete the entry, locate and correct the condition that is responsible for the DECnet error, and return to Option 2 to add the entry again.

If you specify a node address that is already defined in the database, a ROUCONFIG.COM error is displayed, nothing is added to the database, and the Add option is exited.

3.1.2.3 Swap an Existing DECrouter (Option 3) — If you select this option, you can swap an existing DECrouter 2000 for a new hardware unit. You need only specify the Ethernet address of the new unit. All the other characteristics of the original unit are retained in the database. The procedure displays the following message:

```
If  you  use this  option, and you have more than one load host for the
DECrouter, you must modify the database for each load host. To do this,
execute ROUCONFIG on each load host, and select the SWAP option.
```

The procedure asks:

```
What is the node name of the DECrouter you want to swap:
```

Specify the node name of the existing DECrouter 2000 that you want to replace. The configuration procedure displays the Ethernet address of the old unit and asks the following question:

```
DECrouter node-name at Ethernet address nn-nn-nn-nn-nn-nn is being swapped.
Enter the Ethernet address of the new DECrouter to replace node-name.
```

Specify the Ethernet address of the new unit. This address is situated on the *DEC MicroServer Systems Configuration Card* which is on the front of the hardware unit. If the address is not on the card, it can be found on a label on the back of the hardware unit. Enter the Ethernet address as six pairs of hexadecimal digits, with a hyphen separating each pair.

3.1.2.4 Delete an Existing DECrouter (Option 4) — If you select this option, you can delete a DECrouter 2000 from the database. Deleting is used when you reconfigure the network or change the load hosts. ROUCONFIG prompts you for the name of the DECrouter 2000 as follows:

```
What is the DECnet node name of the unit you want to delete:
(CTRL/Z to return to menu)
```

Specify the DECnet node name of the DECrouter 2000 you want to delete. The procedure checks that there is an entry for the specified node name in the database, removes the entry, and returns you to the menu.

If the entry does not exist, ROUCONFIG informs you about this, and returns you to the menu.

3.1.2.5 Restoring Existing DECrouters (Option 5) — If you select this option, you can restore to your load host's DECnet node database all the DECrouter 2000s you have defined using ROUCONFIG. The restore option affects both the volatile and the permanent DECnet databases.

If your network contains a large number of nodes, you may store your DECnet node database on a remote, central node and copy this database to each node at system start-up. DIGITAL advises that you do not define DECrouter 2000s in the central database. When your DECrouter 2000s are not defined in the central database, you must add them each time you copy your local DECnet database from the central database. Use this option to restore existing DECrouter 2000 configurations.

The following messages confirm that the configurations have been restored.

```
Restoring existing DECrouters from local database.
Local database successfully restored.
```

3.1.3 Restoring the Configuration Automatically

You can use an automated command procedure to restore the local database. Run ROUCONFIG.COM with the RESTORE parameter:

```
$ @ROUCONFIG RESTORE
```

The RESTORE parameter by-passes the menu and allows you to include the restore procedure in your system start-up procedures. If you want to restore the down-line load database (the DECnet load database) for your DECrouter 2000s at system start-up, include the following statement in your system startup after the command line that loads DECnet.

```
@SYS$SYSROOT:[DECSERVER]ROUCONFIG RESTORE
```

3.2 Configuring the DECrouter 2000's Permanent Database

The DECrouter 2000's permanent database is configured by running the command procedure called ROUSETUP.COM. Usually, running this command procedure is all you need to do to set up the permanent database.

If you wish to tailor the database to your specific networking requirements, you should run the ROUPERM program which is documented in the *DECrouter 2000 Management Guide.*

The ROUSETUP configuration procedure consists of a series of questions which allow you to set up the following in the DECrouter 2000's permanent database:

- The node name.
- The type of routing node.
- The access control strings required to protect the database.
- The lines used, and their associated parameters.
- The circuits used, and their associated parameters.

ROUSETUP is an interactive procedure. You simply supply the information requested by the displayed question. You can obtain HELP by entering a ?, and you can exit from the procedure by entering <CTRL/Z>.

If you run ROUSETUP on a single system, the software must already be installed on that system. If your load host is a member of a VAXcluster, the distribution software can be installed on any node within the VAXcluster - not necessarily the node where you are running the procedure.

3.2.1 Running ROUSETUP

Log into the system account, or any account with OPER and SYSPRV privileges, and enter the following commands:

```
$ SET DEFAULT SYS$SYSROOT:[DECSERVER]
$ @ROUSETUP
```

The procedure starts by displaying the following message:

```
This command procedure sets up the permanent database for the
DECrouter 2000.  Usually, executing this procedure is all you
need to do to set up the database.

The  procedure consists of a series of questions.  If you need
help with  answering a question, enter ? as a response and the
HELP text will be displayed.
```

The procedure first asks you for the node name of the DECrouter 2000.

```
DECrouter 2000 node name:
```

Enter the node name of the DECrouter 2000. The DECnet node name for your DECrouter 2000 consists of from 1 to 6 alphanumeric characters, one of which must be alphabetic. This name identifies the DECrouter 2000 within the network.

The procedure then asks about the type of router that you want the DECrouter 2000 to be set up as.

```
Do you want node-name to be an AREA router [NO]:
```

A DECrouter 2000 can be either an AREA (Level 2) router or a ROUTING IV (Level 1) router.

An AREA router can forward packets from one area within a network to another area. A ROUTING IV router can only forward packets within its own area.

The procedure then asks you about the Ethernet circuit cost to be used with the DECrouter 2000.

```
Ethernet circuit cost [4]:
```

Specify a value in the range 1 to 63. The cost is a value assigned to a circuit between two adjacent nodes. Packets are routed along paths with the smallest cost.

You are now asked about the router priority for the DECrouter 2000.

```
Router priority [64]:
```

Specify a value in the range 1 to 127. The router with the highest priority will become the designated router for the Ethernet. You are then asked about the number of lines that you want to use with the DECrouter 2000. The procedure displays the following:

```
The DECrouter 2000 supports the following combinations of lines,
line speeds and ports. Specify the type you require.

 Type   Number of lines    Maximum speed              Ports
                           (bits per second)
  1           4                64K                0, 1, 2, 3
  2           2               256K                  0, 1

Type [1]:
```

The type specifies how you are going to use the DECrouter 2000. The DECrouter 2000 can support two types of operation. Each type has certain lines, line speeds and ports associated with it. For speeds of up to 64K bits per second for each line, specify type 1. For speeds of up to 256K bits per second for each line, specify type 2.

The procedure then displays how the DECrouter 2000 will be configured. For example:

```
node-name will be configured as a ROUTING IV router with
4 lines each capable of operating at speeds up to 64 Kb
```

You are then prompted for the following information about each line:

- The line name. The default line name is SYN-*n* where *n* is the port on the hardware that the line uses. For example:

  ```
  Line 1 name [SYN-1]:
  ```

  If you do not use the default, you should specify a string of between 1 and 16 characters for the line name.

- The line state. The default line state is ON. For example:

  ```
  Line line-name state [ON]:
  ```

  The status of the line can be ON or OFF.

- The name of the circuit associated with the line. The default circuit name is the same as the line name. For example:

  ```
  Name of circuit associated with line line-name [line-name]:
  ```

  If you do not use the default, you should specify a string of between 1 and 16 characters for the circuit name.

- The state of the circuit. The default circuit state is ON. For example:

  ```
  Circuit circuit-name state [ON]:
  ```

  The status of the circuit can be ON or OFF.

- The cost for the circuit. The default value is 5. For example:

  ```
  Circuit circuit-name cost [5]:
  ```

  Specify a value between 1 and 63 for the circuit cost. The cost is a value assigned to a circuit between two adjacent nodes. Packets are routed on paths with the least cost.

You will now be asked about the access control information which will be used to control who can alter the database and who can use the TRACE utility from a VMS node (if installed). For each set of information, specify a username and password. The username and password each consist of 1-16 alphanumeric or punctuation characters. You will be asked to verify your entry for the password.

NOTE

You are strongly advised to set up a username and password for the NML object. If you do not, any user within the network can modify your DECrouter 2000.

```
Enter the username and password to be used to control access to the
DECrouter. This information must be supplied whenever the lines and
circuits on the DECrouter 2000 are being modified.
If this information is not specified, anyone can modify the DECrouter
2000.

NML Username [NONE]:
NML Password:
Verification:
```

Remember what you have specified for the username and password, as you will need to use it in order make future modifications to the DECrouter 2000 database. The procedure then asks about the username and password for the TRACE utility.

NOTE

You are strongly advised to set up a username and password for the TRACE utility. If you do not, any user within the network with TRACE installed on their VMS node can monitor the traffic on your DECrouter 2000.

```
Enter the username and password to be used for the TRACE utility.
This information must be supplied when using the TRACE utility on the
DECrouter.
If this information is not specified, anyone can monitor traffic on
the DECrouter 2000.

TRACE Username [NONE]:
TRACE Password:
Verification:
```

Remember what you have specified for the username and password, as you will need to specify the information when you use the TRACE utility.

Once you have supplied all the required information, the procedure checks for an existing configuration file. If there is already a file for this DECrouter 2000 node, the following is displayed:

```
A configuration file for node-name already exists.

Do you want to create another [YES]:
```

If you answer YES, the old file will be renamed to SYS$COMMON:[DECSERVER]ROU*nodename*.OLD.

The procedure then displays the following message.

```
The following commands will be executed to create the permanent database:
```

The procedure then lists the commands it will use to create the permanent database and then asks:

```
Do you want these commands to be executed [YES]:
```

Answer YES, and the permanent database will be created for you. If you answer NO, you should re-run the ROUSETUP procedure in order to create the permanent database. Once the permanent database has been created, the procedure displays:

```
Generating an Installation Checkout Procedure (ICP) for the DECrouter.
This is a command file that can be run at any time after both the
hardware and software installation is completed.  The ICP will verify
that the DECrouter 2000 has been installed correctly.


The ICP will be called "SYS$COMMON:[DECSERVER]ROU_node_name.ICP"
```

Now you have set up the databases, you can load the DECrouter 2000 and check the installation by running the ICP.

3.3 Loading the Software and Checking the Installation

There are three stages in checking the installation.

- First check the load host installation by down-line loading the DECrouter 2000 software image.
- Then run the ICP.
- Finally check the DECrouter 2000 system by issuing a few NCP commands.

Refer to Sections 3.3.1 to 3.3.3 for details.

When you check the load host installation, you can confirm that:

- The correct files are in the correct directory.
- The entry for the DECrouter 2000 in the database is correct.
- The down-line load has worked.

When you run the ICP, you can check the DECrouter 2000 installation.

When you check the DECrouter 2000 system, you can confirm that:

- The correct version of the software is running on the DECrouter 2000.
- The hardware unit works with the DECrouter 2000 software.

3.3.1 Loading the Software

First enable event logging on the load host by issuing the following commands:

```
$ REPLY/ENABLE=NETWORK
$ RUN SYS$SYSTEM:NCP
NCP> SET LOGGING MONITOR EVENT 0.3,7
NCP> SET LOGGING MONITOR EVENT 225.0
NCP> SET LOGGING MONITOR STATE ON
```

Then down-line load the DECrouter 2000 software image on to the hardware unit by plugging the unit into the power supply. As the hardware unit comes up, it goes through a series of diagnostic checks and then automatically requests the down-line load of the software image from the load host. Once the load is complete, the display on the rear of the hardware unit will display a moving pattern which indicates that the software is running.

The DECrouter 2000 then attempts to down-line load the permanent configuration database created by ROUSETUP.

When loading the software, the DECrouter 2000 will try for 5 minutes to load the permanent database, and then reboots if the database cannot be loaded.

If no errors are reported, you can assume that the load has been successful. You can ensure that the load file and the permanent database have loaded correctly by checking for 0.3 events. For example:

```
%%%%%%%%%%  OPCOM  19-AUG-1987 17:53:52.20  %%%%%%%%%%
(from node KANGA at 19-AUG-1987 17:53:42.15)
Message from user DECNET on KANGA
DECnet event 0.3, automatic line service
From node 12.53 (KANGA), 19-AUG-1987 17:53:42.12
Circuit UNA-0, Load, Requested, Node = 12.541 (ROO)
File = MOM$LOAD:ROO010.SYS, Operating system
Ethernet address = 08-00-2B-04-4D-C7
```

```
%%%%%%%%%%  OPCOM  19-AUG-1987 17:54:23.15  %%%%%%%%%%
(from node KANGA at 19-AUG-1987 17:54:23.63)
Message from user DECNET on KANGA
DECnet event 0.3, automatic line service
From node 12.313 (KANGA), 19-AUG-1987 17:54:23.61
Circuit UNA-0, Load, Successful, Node = 12.541 (ROO)
File = MOM$LOAD:ROOO10.SYS, Operating system
Ethernet address = 08-00-2B-04-4D-C7

%%%%%%%%%%  OPCOM  19-AUG-1987 18:31:26.02  %%%%%%%%%%
(from node KANGA at 19-AUG-1987 18:31:15.99)
Message from user DECNET on KANGA
DECnet event 0.3, automatic line service
From node 12.53 (KANGA), 19-AUG-1987 18:31:15.98
Circuit UNA-0, Load, Requested, Node = 12.541 (ROO)
File = MOM$LOAD:ROUROO, Operating system, Ethernet address=AA-00-04-00-1D-AA

%%%%%%%%%%  OPCOM  19-AUG-1987 18:31:34.07  %%%%%%%%%%
(from node KANGA at 19-AUG-1987 18:31:24.05)
Message from user DECNET on KANGA
DECnet event 0.3, automatic line service
From node 12.53 (KANGA), 19-AUG-1987 18:31:24.03
Circuit UNA-0, Load, Successful, Node = 12.541 (ROO)
File = MOM$LOAD:ROUROO, Operating system, Ethernet address=AA-00-04-00-1D-AA
```

The following messages are examples of unsuccessful attempts to load the DECrouter 2000 and the permanent database.

```
%%%%%%%%%%  OPCOM  19-AUG-1987 18:31:06.02  %%%%%%%%%%
(from node KANGA at 19-AUG-1987 18:30:55.99)
Message from user DECNET on KANGA
DECnet event 0.3, automatic line service
From node 12.53 (KANGA), 19-AUG-1987 18:30:55.98
Circuit UNA-0, Load, Line communication error
%SYSTEM-F-TIMEOUT, device timeout
Node = 12.541 (ROO), File = MOM$LOAD:ROOO10.SYS
Operating system, Ethernet address = 08-00-2B-04-4D-C7

%%%%%%%%%%  OPCOM  19-AUG-1987 18:31:26.82  %%%%%%%%%%
(from node KANGA at 19-AUG-1987 18:31:16.79)
Message from user DECNET on KANGA
DECnet event 225.0
From node 12.541 (ROO), 19-AUG-1987 18:31:15.54
Error in Permanent Database Configuration, Executor Node
[-6, 3999]
```

```
%%%%%%%%%%  OPCOM  19-AUG-1987 18:31:27.27  %%%%%%%%%%
(from node KANGA at 19-AUG-1987 18:31:16.82)
Message from user DECNET on KANGA
DECnet event 225.0
From node 12.541 (ROO), 19-AUG-1987 18:31:15.94
Error in Permanent Database Configuration, Circuit ETHERNET
[-22, 901]
```

If these events are logged, correct the problem, and try to reload the software. This may mean that you have to re-run the ROUCONFIG and/or ROUSETUP procedures. If load problems still occur, check that the hardware is working correctly.

If the hardware is working correctly, the problem is probably due to the load host. Check the load host database and make sure that you have entered the correct Ethernet address for the DECrouter 2000. Check that the DECrouter 2000 images are in the correct directory and that DECnet is running. Check for any event messages. Refer to the *DECrouter 2000 Problem Solving Guide* for full details of how to solve problems that may occur when using the DECrouter 2000 software and the hardware unit.

3.3.2 Running the ICP

You can use the ICP at any time to check that the installation has worked correctly. Run the ICP by issuing the following command:

```
$ @MOM$LOAD:ROU_node_name.ICP
```

where *node-name* is the name of the DECrouter 2000. The following message is displayed:

```
DECrouter 2000 installation checkout procedure for node node_name
```

This procedure will check that the installation of the DECrouter 2000 *node_name* completed successfully.

If the ICP completes with no problems, the following message is displayed:

```
%ROU-S-SUCCESS, node_name installation checkout procedure successful.
```

If the ICP fails, you will see an NCP message which indicates why the ICP has failed. For example:

```
%NCP-F-CONNEC, unable to connect to listener
SYSTEM-F-UNREACHABLE, remote node is not currently reachable
```

followed by:

```
%ROU-F-FAILED, node_name installation checkout procedure failed.
```

Correct the problem shown in the NCP message and re-run the ICP.

3.3.3 Checking the DECrouter 2000 System Installation

Issue the following NCP commands in order to check that the DECrouter 2000 system is working correctly.

1. Issue the SET EXECUTOR NODE command to specify the DECrouter 2000 as the executor node.

   For example:

   ```
   NCP> SET EXECUTOR NODE KOALA USER username PASSWORD password
   ```

   where *username* and *password* are the username and password that you have specified for the NML object in ROUSETUP.COM.

2. Use the SHOW EXECUTOR command to check that the DECrouter 2000 is running, and that the correct version of the software is loaded. For example:

   ```
   Node Volatile Summary as of  15-AUG-1987 15:38:47

   Executor node = 12.54 (KOALA)

   State                     = on
   Identification            = DECrouter 2000 V1.0 BL4
   Active links              = 1
   ```

3. Use the SHOW KNOWN CIRCUITS command to check that the circuits are working correctly. For example:

```
Known Circuit Volatile Status as of 15-AUG-1987 15:39:04

Circuit       State                Loopback   Adjacent     Block
                                    Name       Node        Size

SYN-0         on                             12.5  (KANGA)   576
SYN-1         on       -starting
ETHERNET      on                             12.22 (ROO)     576
                                             12.23 (POSSUM)  576
```

4. Issue the CLEAR EXECUTOR NODE command to return to your VAX/VMS node.

PART 2

USING AN ULTRIX LOAD HOST

4
Installation Procedures for ULTRIX

This chapter explains how to install the DECrouter 2000 software on to an ULTRIX load host. During the installation you will need to provide the information that you supplied in Table 1-3.

4.1 Installing the DECrouter 2000 Software

To install the DECrouter 2000 software, carry out the following procedure:

Log in to the system as superuser. Check that the disk has enough free space for the DECrouter 2000 image and configuration file to be installed. Remember to include enough space for up-line dumps from the DECrouter 2000. Refer to Table 1-1 for details of how much free disk space you need on your system to install the DECrouter 2000 software.

Issue the following command:

```
csh# cd /usr/lib/dnet
```

Execute the following command to copy all the files from the distribution medium to the disk.

```
csh# tar xfunction-modifiers .
```

NOTE

On the tar command line, the key argument contains the function letter *x*. The function modifiers that you need to use will depend on two things: your kit medium type and your system configuration. For example:

```
csh# tar vxf /dev/rmt8 .
```

for copying from a TK50 cassette. See the *ULTRIX-32 Programmer's Manual* for a complete description of the **tar** command.

You should then print the Release Notes. Issue the **lpr** command and specify the release notes file (rou010.release_notes).

While reading the Release Notes, check for any issues that are likely to affect the operation of the DECrouter software.

Refer to Appendix C for a list of the files contained in the DECrouter 2000 distribution software. After you have installed the distribution files, run the configuration shell scripts – **rouconfig**, to configure the load host's node database and **rousetup** to configure the DECrouter 2000 permanent database. Refer to Chapter 5 for information about these scripts.

4.2 Installing on Multiple Load Hosts

You are advised to install the DECrouter 2000 software on to at least one other load host. The second load host can down-line load the software to the DECrouter 2000 if the first load host is not available. The second load host can also be used to receive up-line dumps from the DECrouter 2000. You can use any ULTRIX Phase IV DECnet node as a load host provided the node is connected to the same Ethernet as the hardware unit and is running at least V1.2 of ULTRIX.

To install the DECrouter 2000 software on to more than one load host, repeat the installation procedure given in Section 4.1.

5
Configuring the Databases for ULTRIX Load Hosts

This chapter describes the configuration procedure for:

- The ULTRIX load host database
- The DECrouter 2000 permanent database

The chapter also explains how to load the DECrouter 2000.

The load host database contains information on the DECrouter 2000s that are to use the load host for down-line loading the DECrouter 2000 software. You need to configure the database before you can down-line load the DECrouter software.

The DECrouter 2000 permanent database contains the information required for the DECrouter 2000 to communicate with other nodes in the network.

After you have installed the software on to the load host, you should first run the shell script rouconfig to set up the load host database, and then run the shell script rousetup to set up the DECrouter 2000's permanent database. Refer to Section 5.1 for details of rouconfig; refer to Section 5.2 for details of rousetup

NOTE

You must not load the DECrouter 2000 until you have run these two command procedures. Refer to Section 5.3 for details of how to load the DECrouter 2000.

5.1 Configuring the Load Host Database

This configuration process is controlled by a menu-driven procedure called rouconfig which allows you to define, modify and delete entries about DECrouters in the load host's database.

The rouconfig file is copied to your system during the installation procedure.

The rouconfig script allows you to:

- List the DECrouters defined in the load host database.
- Add an entry for a new DECrouter in the load host database which will identify the DECrouter on the Ethernet.
- Swap an existing DECrouter for a new one. If you swap a DECrouter, all the original DECrouter characteristics are retained, but the Ethernet address of the new unit is added to the database.
- Delete an entry for a DECrouter from the load host database. When you delete an entry, the load host no longer recognizes the DECrouter, so is no longer a load host for that DECrouter. Database entries are deleted when the network is reconfigured or when you assign a DECrouter to another load host.
- Restore existing DECrouters to your DECnet load database. This copies DECrouter entries from the load host database to the DECnet load database, so reconfiguring the DECnet load database. This is useful when you copy your local DECnet database from a central DECnet database which does not contain entries for the DECrouters.

rouconfig modifies the following databases:

1. The load host database (containing information about the DECrouters) which is displayed when you select the List option from the menu. This database is stored in the file called rouconfig.dat.
2. The volatile DECnet load host database.
3. The permanent DECnet load host database.

When running the rouconfig script, information is sometimes transferred from the load host database to the DECnet database. rouconfig keeps these two databases synchronized.

rouconfig enables the service circuit that will be used to down-line load the DECrouter software from the load host to the DECrouter.

5.1.1 Preparation for the Configuration Procedure

Before you run the rouconfig script, perform the following checks:

1. Ensure that DECnet is running on your load host node, and that ncp (the Network Control Program) has been installed.
2. Ensure that you know the DECnet node name and DECnet node address for each DECrouter you want to add to the database. The DECnet node name and address can be found on the *DEC MicroServer Systems Configuration Card* on the front of the hardware unit and in Table 1-3 in this manual.
3. Ensure that you know the Ethernet address of each DECrouter you want to add to the database. The Ethernet address can be found on the back of the hardware unit, on the *DEC MicroServer Systems Configuration Card* on the front of the hardware unit and in Table 1-3 in this manual.

5.1.2 Running rouconfig

rouconfig is an interactive menu-driven procedure. When the menu is displayed, select an option and enter <RET>. You can obtain HELP by entering a ?. When you have finished answering the questions on a selected option, the program returns you to the menu.

If you want to exit from an option without making any changes, enter 6 and the program returns you to the menu. Enter <CTRL/D> to exit from the procedure.

If you have selected the Add, Delete or Swap options, ncp messages may be displayed when you have completed the option. If an error message is displayed, the operation may not have been successful. Therefore you should repeat the operation.

To run rouconfig, the software must already be installed on the load host.

Log in as superuser, and enter the following commands:

```
csh# cd /usr/lib/dnet
csh# ./rouconfig
```

rouconfig checks that DECnet is running. If DECnet is down, a warning message is displayed and the procedure exits. If this happens, start DECnet before running the script again.

You are first reminded that each DECrouter must have a unique DECnet node name and DECnet node address. The procedure asks if you want to continue or exit as follows:

```
Press (RET) to start, or 6 to exit.
```

If you press <RET>, rouconfig displays the following:

```
                DECrouter Configuration Procedure

                        Menu of Options

                   1 - List known DECrouters

                   2 - Add a DECrouter

                   3 - Swap an existing DECrouter

                   4 - Delete an existing DECrouter

                   5 - Restore existing DECrouters

                   6 - Exit from this procedure

Your choice:
```

Select the number that corresponds to the option you want and press <RET>. Sections 5.1.2.1 to 5.1.2.5 describe the options.

5.1.2.1 List Known DECrouters (Option 1) — If you select this option, the contents of the rouconfig.dat file is displayed as seven columns.

For example:

```
DECnet   DECnet  Router  Service
Address  Node    Type    Circuit  Ethernet Address  Load File   Dump File
-------  ------  ------  -------  ----------------  ---------   ---------

12.1001  KANGA   DR2000  UNA-0    08-00-2B-02-CC-24 rou010.sys  ROUKANGA.DMP
12.1002  KOALA   DR2000  UNA-0    08-00-2B-02-AA-23 rou010.sys  ROUKOALA.DMP

Total of 2 DECrouter(s) defined.

(Press RETURN for menu)
```

The display shows information about the load host database including the names of the load and dump files used by the database.

A DECrouter dumps its memory into a DECrouter dump file either as a result of a failure or in response to a request by the network manager. This file can be used for diagnosing any problems that may arise when using a DECrouter. If a DECrouter repeatedly crashes and an up-line dump is produced, copy the dump to a suitable form of media and send it with a Software Performance Report (SPR) to DIGITAL. Refer to the *DECrouter 2000 Problem Solving Guide* for details on how to submit an SPR.

The naming convention used for the load and dump files is as follows:

rou010.sys
rou*router*.DMP

where *router* is the node name of the DECrouter.

5.1.2.2 Add a DECrouter (Option 2) — If you select this option, you can add a new entry to the load host database. When you define a new entry you must supply:

1. The DECrouter type
2. A unique DECnet node name for the DECrouter 2000
3. A unique DECnet node address for the DECrouter 2000
4. The Ethernet address of the DECrouter
5. The name of the load host's service circuit which will be used to down-line load the DECrouter 2000

The DECrouter 2000's DECnet node name and address, its Ethernet address and the name of the load host's service circuit can be found in Table 1-3 in this manual.

You will be prompted to supply the above information as follows:

```
DECrouter type (DR200, DR2000):
```

Specify DR2000 for a DECrouter 2000, which allows you to use up to four synchronous lines. If you specify DR200, you can use the DECrouter 200 which has up to eight asynchronous lines. Refer to the DECrouter 200 documentation for details of this product.

DECnet node name for unit:

Specify the DECnet node name for the DECrouter. This node name consists of up to six alphanumeric characters (one of which must be a letter). The name must be unique for your DECnet network.

DECnet node address for unit:

Specify the DECnet node address for the DECrouter. This is a decimal number from 1 to 1023 and must be unique for your DECnet network. If your network is divided into areas, include the area number within the address (the area address is inserted in front of the node address). For example, if an address is 12.1001, 12 is the area number and 1001 is the node number. If you omit the area number, the area number of the current load host is used as a default.

Ethernet address for unit (nn-nn-nn-nn-nn-nn):

Specify the Ethernet address of the DECrouter. This address is situated on the *DEC MicroServer Systems Configuration Card* which is on the front of the hardware unit. If the address is not on the card, it can be found on a label on the back of the hardware unit. Enter the Ethernet address as six pairs of hexadecimal digits, with a hyphen separating each pair. For example: 08-00-2B-02-AA-23.

DECnet Service Circuit-ID [*default-id*]:

Specify the service circuit for your load host's Ethernet controller type as follows:

- UNA-*n* for DEUNA or DELUA
- QNA-*n* for DEQNA
- BNT-*n* for DEBNT
- BNA-*n* for DEBNA
- SVA-*n* for DESVA

were *n* is an integer.

Whenever you run this configuration procedure, you will be asked for the service circuit-ID. The first time you are asked for the circuit-ID, the default response will be determined by the processor type of the ULTRIX load host. If you specify a different service circuit-ID, this new circuit-ID becomes the new default. Table 5-1 lists the default values for each CPU type.

Table 5-1: CPU Type and Service Circuits

CPU Type	Default Service Circuit-ID
VAX-11/725, 730, 750, 780, 785	UNA-0
VAX 8200, 8600, 8650	UNA-0
MicroVAX I, MicroVAX II	QNA-0
MicroVAX 2000 VAXstation 2000	SVA-0

Once you have specified the service circuit-ID, rouconfig adds the new entry to the database, and sets SERVICE ENABLED on the circuit. This will allow the load host to down-line load the DECrouter software image to the DECrouter.

NOTE

When ROUCONFIG sets SERVICE ENABLED on the circuit, the circuit may be turned off and then turned on again which may cause events to be logged.

If a DECnet ncp error message is displayed while you are adding a DECrouter to the database, the entry will be added to the rouconfig.dat file, but will not be added to the DECnet database. Therefore, you should immediately use Option 4 to delete the entry, locate and correct the condition that is responsible for the DECnet error, and return to Option 2 to add the entry again.

If you specify a node address that is already defined in the database, a rouconfig error is displayed, nothing is added to the database and the Add option is exited.

5.1.2.3 Swap an Existing DECrouter (Option 3) — If you select this option, you can swap an existing DECrouter for a new hardware unit. You need only specify the Ethernet address of the new unit. All the other characteristics of the original unit are retained in the database. The procedure displays the following message:

```
If you use this option, and you have more than one load host for the
DECrouter, you must modify the database for each load host. To do this,
execute ROUCONFIG on each load host, and select the SWAP option.
```

The procedure asks:

```
What is the node name of the DECrouter you want to swap:
```

Specify the node name of the existing DECrouter that you want to replace. The configuration procedure displays the Ethernet address of the old unit and asks the following question:

```
DECrouter node-name at Ethernet address nn-nn-nn-nn-nn-nn is being swapped.
Enter the Ethernet address of the new DECrouter to replace node-name.
```

Specify the Ethernet address of the new unit. This address is situated on the *DEC MicroServer Systems Configuration Card* which is on the front of the hardware unit. If the address is not the card, it can be found on a label on the back of the hardware unit. Enter the Ethernet address as six pairs of hexadecimal digits, with a hyphen separating each pair.

5.1.2.4 Delete an Existing DECrouter (Option 4) — If you select this option, you can delete a DECrouter from the database. Deleting is used when you reconfigure the network or change the load hosts. rouconfig prompts you for the name of the DECrouter as follows:

```
Enter the DECnet node name of the DECrouter you want to delete,
or press 6 to return to menu:
```

Specify the DECnet node name of the DECrouter you want to delete. The procedure checks that there is an entry for the specified node name in the database, and removes the entry and returns you to the menu.

If the entry does not exist, rouconfig informs you about this, and returns you to the menu.

5.1.2.5 Restoring Existing DECrouters (Option 5) — If you select this option, you can restore to your load host's DECnet node database all the DECrouters you have defined using rouconfig. The restore option affects both the volatile and permanent DECnet databases.

The following messages confirm that the configurations have been restored:

```
Restoring existing DECrouters from local database.
Local database successfully restored.
```

5.2 Configuring the DECrouter 2000's Permanent Database

The DECrouter 2000's permanent database is configured by running the shell script called rousetup. Usually, running this command procedure is all you need to do to set up the permanent database.

If you wish to tailor the database to your specific networking requirements, you should run the rouperm program which is documented in the *DECrouter 2000 Management Guide.*

The rousetup configuration script consists of a series of questions which allow you to set up the following in the DECrouter 2000's permanent database:

- The node name
- The type of routing node
- The access control strings required to protect the database
- The lines used with their associated parameters
- The circuits used with their associated parameters

rousetup is an interactive procedure. You simply supply the information requested by the displayed question. You can obtain HELP by entering a ?, and you can exit from the procedure by entering <CTRL/D>.

To run rousetup, the software must already be installed on the system.

5.2.1 Running rousetup

Log in as superuser and enter the following command:

```
csh# ./usr/lib/dnet/rousetup
```

The procedure starts by displaying the following message:

```
This shell script sets up the permanent database for the
DECrouter 2000. Usually, executing this script is all you
need to do to set up the database.

The script consists of a series of questions. If you need
help with answering a question, enter ? as a response and the
HELP text will be displayed.
```

The procedure first asks you for the node name of the DECrouter 2000.

```
DECrouter 2000 node name:
```

Enter the node name of the DECrouter 2000. The DECnet node name for your DECrouter 2000 consists of from 1 to 6 alphanumeric characters, one of which must be alphabetic. This name identifies the DECrouter within the network.

The procedure then asks about the type of router that you want the DECrouter 2000 to be set up as.

```
Do you want node-name to be an AREA router [NO]:
```

A DECrouter 2000 can be either an AREA (Level 2) router or a ROUTING IV (Level 1) router.

An AREA router can forward packets from one area within a network to another area. A ROUTING IV router can only forward packets within its own area.

The procedure then asks you about the Ethernet circuit cost to be used with the DECrouter 2000.

```
Ethernet circuit cost [4]:
```

Specify a value in the range 1 to 63. The cost is a value assigned to a circuit between two adjacent nodes. Packets are routed along paths with the smallest cost.

You are now asked about the router priority for the DECrouter 2000.

```
Router priority [64]:
```

Specify a value in the range 1 to 127. The router with the highest priority will become the designated router for the Ethernet.

You are then asked about the number of lines that you want to use with the DECrouter 2000. The procedure displays the following:

```
The DECrouter 2000 supports the following combinations of lines,
line speeds and ports. Specify the type you require.

 Type   Number of lines    Maximum speed              Ports
                           (bits per second)
  1           4                64K                0, 1, 2, 3
  2           2               256K                  0, 1

Type [1]:
```

The type specifies how you are going to use the DECrouter 2000. The DECrouter 2000 can support two types of operation. Each type has certain lines, line speeds and ports associated with it. For speeds of up to 64K bits per second for each line, specify type 1. For speeds of up to 256K bits per second for each line, specify type 2.

The procedure then displays how the DECrouter 2000 will be configured. For example:

```
node-name will be configured as a ROUTING IV router with
4 lines each capable of operating at speeds up to 64 Kb
```

Your are then prompted for the following information about each line:

- The line name. The default line name is SYN-*n* where *n* is the port on the hardware that the line uses. For example:

  ```
  Line 1 name [SYN-1]:
  ```

  If you do not use the default, you should specify a string of between 1 and 16 characters for the line name.

- The line state. The default line state is ON. For example:

  ```
  Line line-name state [ON]:
  ```

  The status of the line can be ON or OFF.

- The name of the circuit associated with the line. The default circuit name is the same as the line name. For example:

  ```
  Name of circuit associated with line line-name [linename]:
  ```

  If you do not use the default, you should specify a string of between 1 and 16 characters for the circuit name.

- The state of the circuit. The default circuit state is ON. For example:

  ```
  Circuit circuit-name state [ON]:
  ```

  The status of the circuit can be ON or OFF.

- The cost for the circuit. The default value is 5. For example:

  ```
  Circuit circuit-name cost [5]:
  ```

  Specify a value between 1 and 63 for the circuit cost. The cost is a value assigned to a circuit between two adjacent nodes. Packets are routed on paths with the least cost.

You will now be asked about the access control information which will be used to control who can alter the database and who can use the TRACE utility from a VMS node (if installed). For each set of information, specify a username and password. The username and password each consist of 1-16 alphanumeric or punctuation characters. You will be asked to verify your entry for the password.

NOTE

You are strongly advised to set up a username and password for the NML object. If you do not do so, any user within the network can modify your DECrouter 2000.

```
Enter the username and password to  be  used to control access to the
DECrouter.   This information must be supplied whenever the lines and
circuits on the DECrouter 2000 are being modified.
If this information is not specified, anyone can modify the DECrouter
2000.

NML Username [NONE]:
NML Password:
Verification:
```

Remember what you have specified for the username and password, as you will need to supply the information in order make future modifications to the DECrouter 2000 database. The procedure then asks about the username and password for the TRACE utility.

NOTE

You are strongly advised to set up a username and password for the TRACE utility. If you do not do so, any user within the network with TRACE installed on their VMS node can monitor the traffic on your DECrouter 2000.

```
Enter the username and password to be  used  for  the  TRACE utility.
This information must be supplied when using the VMS TRACE utility on
the DECrouter 2000.
If  this  information is not specified, anyone can monitor traffic on
the DECrouter 2000.

TRACE Username [NONE]:
TRACE Password:
Verification:
```

Remember what you have specified for the username and password, as you will need to supply the information when you use the TRACE utility from a VMS system.

Once you have supplied all the required information, the procedure checks for an existing configuration file. If there is already a file for this DECrouter node, the following is displayed:

```
A configuration file for node-name already exists.

Do you want to create another [YES]:
```

If you answer YES, the old file will be saved in the /usr/lib/dnet directory.

The procedure then displays the following message:

```
The following commands will be executed to create the permanent database:
```

The procedure then lists the commands it will use to create the permanent database and then asks:

```
Do you want these commands to be executed [YES]:
```

Answer YES, and the permanent database will be created for you. If you answer NO, you should re-run the rousetup script in order to create the permanent database.

5.3 Loading the Software and Checking the Installation

There are two stages in checking the installation. First you should check the load host installation by down-line loading the DECrouter software image, and then you should check the DECrouter system by issuing a few ncp commands. Refer to Sections 5.3.1 and 5.3.2 for details.

When you check the load host installation, you can confirm that:

- The correct files are in the correct directory.
- The entry for the DECrouter in the database is correct.
- The down-line load has worked.

When you check the DECrouter system, you can confirm that:

- The correct version of the software is running on the DECrouter.
- The hardware unit works with the DECrouter software.

5.3.1 Loading the Software

Down-line load the DECrouter software image on to the hardware unit by plugging the unit into the power supply. As the hardware unit comes up, it goes through a series of diagnostic checks and then automatically requests the down-line load of the software image from the load host. Once the load is complete, the display on the rear of the hardware unit will display a moving pattern which indicates that the software is running.

The DECrouter 2000 then attempts to down-line load the permanent configuration database created by rousetup.

When loading the software, the DECrouter 2000 will try for 5 minutes seconds to load the permanent database, and then reboots if the database cannot be loaded.

If there are problems with loading the software, you may have to re-run the rouconfig and/or rousetup scripts. If load problems still occur, check that the hardware is working correctly. Refer to the *DECrouter 2000 Problem Solving Guide* for details.

If the hardware is working correctly, the problem is probably due to the load host. Check the load host database and make sure that you have entered the correct Ethernet address for the DECrouter. Check that the DECrouter images are in the correct directory and that DECnet is running.

5.3.2 Checking the DECrouter 2000 System Installation

Issue the following ncp commands in order to check that the DECrouter system is working correctly.

1. Issue the set executor node command to specify the DECrouter as the executor node.

   For example:

   ```
   ncp>set executor node koala user username password password
   ```

   where *username* and *password* are the username and password that you have specified for the NML object in rousetup.

2. Use the show executor command to check that the DECrouter is running, and that the correct version of the software is loaded. For example:

```
Node Volatile Summary as of  15-AUG-1987 20:38:47

Executor node = 12.54 (KOALA)

State                    = on
Identification           = DECrouter 2000 V1.0 BL4
Active links             = 1
```

3. Use the show known circuits command to check that the circuits are working correctly. For example:

```
Known Circuit Volatile Status as of 15-AUG-1987 15:39:04

Circuit          State                Loopback      Adjacent  Block
                                        Name          Node     Size

BEAN             on                                12.5  (KANGA)   576
ETHERNET         on                                12.22 (ROO)     576
                                                   12.23 (POSSUM)  576
PEA              on       -starting
```

4. Issue the clear executor node command to return to your ULTRIX node.

A

Example VMS Installation and Configuration

```
@sys$update:vmsinstal rou mua0:

               VAX/VMS Software Product Installation Procedure V4.5


It is 23-AUG-1987 at 17:34.
Enter a question mark (?) at any time for help.
%VMSINSTAL-W-DECNET, Your DECnet network is up and running.
* Do you want to continue anyway [NO]? y
* Are you satisfied with the backup of your system disk [YES]? <RET>

Please mount the first volume of the set on MUA0:.
* Are you ready? y
%MOUNT-I-MOUNTED, ROU mounted on POSSUM$MUA0:
The following products will be processed:
  ROU V1.0

               Beginning installation of ROU V1.0 at 17:36
%VMSINSTAL-I-RESTORE, Restoring product saveset A...

Release Notes Options:

      1. Display release notes
      2. Print release notes
      3. Both 1 and 2

* Select option [3]: 2

* Queue name [SYS$PRINT]: <RET>
```

```
* Do you want to continue the installation [N]? <RET>

            VMSINSTAL procedure done at 17:40

%VMSINSTAL-I-RELMOVED, The products release notes have been successfully
moved to SYS$HELP.

@sys$update:vmsinstal rou mua0:

* Do you want to purge files replaced by this installation [YES]? y
* Do you want the TRACE utility [YES]? y
%CREATE-I-EXISTS, VMI$ROOT:[DECSERVER] already exists
%LIBRAR-S-REPLACED, module TRACE replaced in VMI$ROOT:[SYSHLP]HELPLIB.HLB;2

The system logical MOM$LOAD is already defined as
POSSUM:[SYS7.SYSROOT.][MOM$SYSTEM]
To load the DECrouter 2000, MOM$LOAD should be redefined as:
POSSUM:[SYS7.SYSROOT.][MOM$SYSTEM],SYS$SYSROOT:[DECSERVER]
* Do you want to redefine this now [YES]? <RET>
```

The installation is now complete. After exiting from VMSINSTAL, do the following:

1. If the definition for MOM$LOAD in the system start-up file does not contain SYS$SYSROOT:[DECSERVER], you must edit your system start-up file so that it defines the logical MOM$LOAD as a search string with a value equal to itself and the element SYS$SYSROOT:[DECSERVER]. For example:

   ```
   DEFINE/SYSTEM/EXEC/NAME_ATTRIBUTE=NO_ALIAS/NOLOG MOM$LOAD -
   "current-search-string",SYS$SYSROOT:[DECSERVER]
   ```

   This command allows the location of the DECrouter image to be defined each time the system is rebooted, so the system will load correctly.

2. Configure your DECrouter 2000 into the load host's database. Execute the command procedure called ROUCONFIG.COM which is in the SYS$SYSROOT:[DECSERVER] directory. If you have already executed this procedure from previous installations, you only need to configure any additional DECrouter units. All previously defined DECrouter units will still be configured within the load host's database. Refer to Chapter 3 of the DECrouter 2000 Installation Procedures for further details.

3. Set up the DECrouter 2000 permanent database before powering up the hardware. Execute the command procedure called ROUSETUP.COM which is in the SYS$SYSROOT:[DECSERVER] directory. ROUSETUP.COM generates an ICP which checks that the DECrouter 2000 is fully operational. Refer to Chapter 3 of the DECrouter 2000 Installation Procedures for further details.

```
   If you wish to modify the DECrouter 2000 database for your specific
   networking requirements, execute the ROUPERM.EXE program which is in the
   SYS$SYSTEM directory. This program is described in the DECrouter 2000
   Management Guide.

4. REMINDER: The release notes for the DECrouter 2000 are in a file called
   ROU010.RELEASE_NOTES which is in the SYS$SYSROOT:[DECSERVER] directory.

5. A command file SYS$MANAGER:NETTRACE_INSTALL.COM has been created to
   install the TRACE utility. Edit your system start-up file to execute
   this file each time your system is booted.

%VMSINSTAL-I-MOVEFILES, Files will now be moved to their target directories..
               Installation of ROU V1.0 completed at 17:41

               VMSINSTAL procedure done at 17:41

@sys$sysroot:[decserver]rouconfig

You must assign a unique DECnet node name and DECnet node address for
each DECrouter that you are going to configure. If at any time, you
specify a node name or node address that has already been defined
within the network, the previous definition will be replaced by what
you have specified for the DECrouter.

Enter <RET> to start, or CTRL/Z to exit.

               DECrouter Configuration Procedure

                         Menu of Options

                      1 - List known DECrouters
                      2 - Add a DECrouter
                      3 - Swap an existing DECrouter
                      4 - Delete an existing DECrouter
                      5 - Restore existing DECrouters
                  CTRL/Z - Exit from this procedure

        Your choice: 1

DECnet  DECnet Router Service
Address Node   Type   Circuit Ethernet Address  Load File     Dump File
------- ------ ------ ------- ----------------- ------------- -------------

Total of 0 DECrouters defined.
(Press RETURN for menu)
```

```
              DECrouter Configuration Procedure

                        Menu of Options

                     1 - List known DECrouters
                     2 - Add a DECrouter
                     3 - Swap an existing DECrouter
                     4 - Delete an existing DECrouter
                     5 - Restore existing DECrouters
                  CTRL/Z - Exit from this procedure

        Your choice: 2

    Enter ? if you require help, enter CTRL/Z to return to menu
    without adding a unit to the database.

DECrouter type (DR200, DR2000, X25ROU): dr2000
DECnet node name for unit: koala
DECnet node address for unit: 12.999
Ethernet address for unit (nn-nn-nn-nn-nn-nn): 08-00-2b-03-11-22
DECnet Service Circuit-ID [QNA-0]: <RET>

        If you get an error message now, the new unit will not be added to
        the database, and you  should  delete the entry from the directory
        using the delete option.

              DECrouter Configuration Procedure

                        Menu of Options

                     1 - List known DECrouters
                     2 - Add a DECrouter
                     3 - Swap an existing DECrouter
                     4 - Delete an existing DECrouter
                     5 - Restore existing DECrouters
                  CTRL/Z - Exit from this procedure

        Your choice: 1

DECnet  DECnet Router Service
Address Node   Type   Circuit Ethernet Address  Load File     Dump File
------- ------ ------ ------- ----------------- ------------ -------------
12.999  KOALA  DR2000 QNA-0   08-00-2b-03-11-22 ROU010.SYS   ROUKOALA.DMP

Total of 1 DECrouters defined.
```

```
                DECrouter Configuration Procedure

                          Menu of Options

                          1 - List known DECrouters
                          2 - Add a DECrouter
                          3 - Swap an existing DECrouter
                          4 - Delete an existing DECrouter
                          5 - Restore existing DECrouters
                     CTRL/Z - Exit from this procedure

          Your choice: ^z

@sys$sysroot:[decserver]rousetup

          This command procedure sets up the permanent database for the
          DECrouter 2000.  Usually, executing this procedure is all you
          need to do to set up the database.

          The  procedure consists of a series of questions.  If you need
          help with  answering a question, enter ? as a response and the
          HELP text will be displayed.

DECrouter 2000 node name: koala
Do you want KOALA to be an AREA router [NO]: <RET>
Ethernet circuit cost [4]: <RET>
Router priority [64]: <RET>


    The DECrouter 2000 supports the following combinations of lines,
    line speeds and ports. Specify the type you require.

    Type      Number of lines       Maximum speed            Ports
                                    (bits per second)
      1             4                    64K              0, 1, 2, 3
      2             2                   256K                0, 1


Type [1]:<RET>

          KOALA will be configured as a ROUTING IV router with
          4 lines each capable of operating at speeds up to 64 Kb
```

```
Line 0 name [SYN-0]: 10
Line 10 default state [ON]: <RET>
Name of circuit associated with line 10 [10]: <RET>
Circuit 10 default state [ON]: <RET>
Circuit 10 cost [5]: <RET>

Line 1 name [SYN-1]: <RET>
Line SYN-1 default state [ON]: <RET>
Name of circuit associated with line SYN-1 [SYN-1]: <RET>
Circuit SYN-1 default state [ON]: <RET>
Circuit SYN-1 cost [5]: <RET>

Line 2 name [SYN-2]: 12
Line 12 default state [ON]: <RET>
Name of circuit associated with 12 [12]: c2
Circuit c2 default state [ON]: off
Circuit c2 cost [5]: <RET>

Line 3 name [SYN-3]: <RET>
Line SYN-3 default state [ON]: <RET>
Name of circuit associated with line SYN-3 [SYN-3]: <RET>
Circuit SYN-3 default state [ON]: <RET>
Circuit SYN-3 cost [5]: <RET>

Enter the username and password to  be  used to control access to the
DECrouter.   This information must be supplied whenever the lines and
circuits on the DECrouter 2000 are being modified.
If this information is not specified, anyone can modify the DECrouter
2000.

NML Username [NONE]: dolphin
NML Password: cetacean
Verification: cetacean

Enter the username and password to be  used  for  the  TRACE utility.
This information must be supplied when using the TRACE utility on the
DECrouter.
If  this  information is not specified, anyone can monitor traffic on
the DECrouter 2000.

TRACE Username [NONE]: dolphin
TRACE Password: cetacean
Verification: cetacean

The following commands will be executed to create the permanent database:
```

```
set executor type routing iv
set logging monitor event 0.0-9
set logging monitor event 2.0-1
set logging monitor event 4.2,16,19
set logging monitor event 5.0-21
set circuit ETHERNET router priority 64
set circuit ETHERNET cost 4
set line 10 device SYN-0 state on
set circuit 10 line 10 state off
set circuit 10 cost 5
set circuit 10 state on
set line SYN-1 device SYN-1 state on
set circuit SYN-1 line SYN-1 state off
set circuit SYN-1 cost 5
set circuit 10 state on
set line 12 device SYN-2 state on
set circuit c2 line 12 state off
set circuit c2 cost 5
set circuit 10 state off
set line SYN-3 device SYN-3 state on
set circuit SYN-3 line SYN-3 state off
set circuit SYN-3 cost 5
set circuit 10 state on
set object nml user dolphin password *Set*
set object nettrace$ user dolphin password *Set*

Do you want these commands to be executed [YES]: <RET>

Generating an Installation Checkout Procedure (ICP) for the DECrouter.
This is a  command  file  that  can be  run at any time after both the
hardware and software installation is completed.  The ICP will verify
that the DECrouter 2000 has been installed correctly.

The ICP will be called "SYS$COMMON:[DECSERVER]ROU_KOALA.ICP"
```

B

Example ULTRIX Installation and Configuration

```
csh# cd /usr/lib/dnet
csh# tar vxf /dev/rmt8 .
x ./rou010.release_notes
x ./rou010.sys
x ./rouconfig
x ./rousetup
x ./rouperm

csh# ./rouconfig

You must assign a unique DECnet node name and DECnet node address for
each  new  DECrouter  that you are going to configure. If at any time
you specify a node name or node address that has already been defined
within  the network, the previous definition will be replaced by what
you have specified for the DECrouter.

Please print/read the release notes.
They are in the file /usr/lib/dnet/rou010.release_notes

Press <RET> to start or 6 to exit...
```

```
                DECrouter Configuration Procedure

                        Menu of Options

                    1 - List known DECrouters

                    2 - Add a DECrouter

                    3 - Swap an existing DECrouter

                    4 - Delete an existing DECrouter

                    5 - Restore existing DECrouters

                    6 - Exit from this procedure

Your choice:1

There are no DECrouters defined in the data file

                DECrouter Configuration Procedure

                        Menu of Options

                    1 - List known DECrouters

                    2 - Add a DECrouter

                    3 - Swap an existing DECrouter

                    4 - Delete an existing DECrouter

                    5 - Restore existing DECrouters

                    6 - Exit from this procedure

Your choice:2

Type a ? for help on a question, Type 6 for any
question to return to menu without adding the unit
```

```
DECrouter type (DR200, DR2000): dr2000
DECnet node name for unit: koala
DECnet node address for unit: 12.999
Ethernet address for unit (nn-nn-nn-nn-nn-nn): 08-00-2b-03-11-22
DECnet Service Circuit-ID [QNA-0]: <RET>

               DECrouter Configuration Procedure


                     Menu of Options

                  1 - List known DECrouters

                  2 - Add a DECrouter

                  3 - Swap an existing DECrouter

                  4 - Delete an existing DECrouter

                  5 - Restore existing DECrouters

                  6 - Exit from this procedure


Your choice: 1

DECnet  DECnet Router Service
Address Node   Type   Circuit Ethernet Address  Load File     Dump File
------- ------ ------ ------- ----------------- ------------- -------------

12.999  KOALA  DR2000 QNA-0   08-00-2B-03-11-22 rou010.sys   ROUKOALA.DMP

Total of 1 DECrouters defined.

               DECrouter Configuration Procedure

                     Menu of Options

                  1 - List known DECrouters
                  2 - Add a DECrouter
                  3 - Swap an existing DECrouter
                  4 - Delete an existing DECrouter
                  5 - Restore existing DECrouters
                  6 - Exit from this procedure

        Your choice: 6
```

```
csh# ./rousetup

This shell script sets up the permanent database for the
DECrouter 2000. Usually, executing this script is all you
need to do to set up the database.

The script consists of a series of questions. If you need
help with answering a question, enter ? as a response and the
HELP text will be displayed.

DECrouter 2000 node name: koala
Do you want KOALA to be an AREA router [NO]:yes
Ethernet circuit cost [4]: <RET>
Router priority [64]: <RET>


    The DECrouter 2000 supports the following combinations of lines,
    line speeds and ports. Specify the type you require.

    Type      Number of lines      Maximum speed          Ports
                                   (bits per second)
      1             4                 64K              0, 1, 2, 3
      2             2                256K                0, 1


Type [1]:2

KOALA will be configured as an AREA router with 2 lines each capable
of operating at speeds up to 256 Kb

Line 0 name [SYN-0]: 10
Line 10 default state [ON]: <RET>
Name of circuit associated with line 10 [10]: <RET>
Circuit 10 default state [ON]: <RET>
Circuit 10 cost [5]: <RET>

Line 1 name [SYN-1]: <RET>
Line SYN-1 default state [ON]: <RET>
Name of circuit associated with line SYN-1 [SYN-1]: <RET>
Circuit SYN-1 default state [ON]: <RET>
Circuit SYN-1 cost [5]: <RET>

Enter the username and password to be used to control access to the
DECrouter.  This information must be supplied whenever the lines and
circuits on the DECrouter 2000 are being modified.
If this information is not specified, anyone can modify the DECrouter
2000.
```

```
NML Username [NONE]: dolphin
NML Password: cetacean
Verification: cetacean

Enter the username and password to be  used  for  the  TRACE utility.
This  information  must be supplied  when using the VMS TRACE utility
on the DECrouter 2000.
If  this  information is not specified, anyone can monitor traffic on
the DECrouter 2000.

TRACE Username [NONE]: dolphin
TRACE Password: cetacean
Verification: cetacean

The following commands will be executed to create the permanent database:

set executor type area
set logging monitor event 0.0-9
set logging monitor event 2.0-1
set logging monitor event 4.2,16,19
set logging monitor event 5.0-21
set circuit ETHERNET router priority 64
set circuit ETHERNET cost 4
set line 10 device SYN-0 state on
set circuit 10 line 10 state off
set circuit 10 cost 5
set circuit 10 state on
set line SYN-1 device SYN-1 state on
set circuit SYN-1 line SYN-1 state off
set circuit SYN-1 cost 5
set circuit SYN-1 state on
set object nml user dolphin password *SET*
set object nettrace$ user dolphin password *SET*

Do you want these commands to be executed [YES]: <RET>
```

C
Lists of Files Installed

C.1 For VAX/VMS Load Hosts

The following files are installed on to your VAX/VMS load host.

Into the SYS$COMMON:[DECSERVER] directory:

- ROU010.SYS - the system image which is down-line loaded on to the DECrouter 2000.
- ROUSETUP.COM - the command procedure which sets up the DECrouter 2000's permanent database.
- ROUCONFIG.COM - the command procedure which sets up the load host database.
- ROU010.RELEASE_NOTES - the Release Notes.

Into the SYS$SYSTEM directory:

- ROUPERM.EXE - the configurator program which is used to modify the permanent database.

If you install the TRACE utility, the TRACE files are installed as follows:

Into the SYS$SYSTEM directory:

- NETLTC.EXE - the local TRACE collector.
- NETTRACE.EXE - the TRACE image.

Into the SYS$HELP directory:

- TRACEHLP.HLB - the TRACE HELP file.
- ROUPERM.HLB - the HELP file for the configurator program.

Into the SYS$LIBRARY directory:

- NETTRACE$KEY.INIT - the TRACE keypad
- NETTRACE$NSP_ANALYZE.EXE - the NSP protocol analyzer.
- NETTRACE$SYNC_ANALYZE.EXE - the SYNC protocol analyzer.
- NETTRACE$DDCMP_ANALYZE.EXE - the DDCMP protocol analyzer.
- NETTRACE$ROUTING_ANALYZE.EXE - the ROUTING protocol analyzer.
- NETTRACE$ETHERNET_ANALYZE.EXE - the ETHERNET protocol analyzer.

Into the SYS$MANAGER directory:

- NETTRACE_INSTALL.COM - the command file which installs the TRACE utility.

Into the SYS$MESSAGE directory:

- NETTRACE_MESSAGES.EXE - the TRACE message file.

C.2 For ULTRIX Load Hosts

The following files are installed on to your ULTRIX load host in the /usr/lib/dnet directory.

- rou010.release_notes - the Release Notes.
- rou010.sys - the system image which is down-line loaded on to the DECrouter 2000.
- rouconfig - the command procedure which sets up the load host database.
- rousetup - the command procedure which sets up the DECrouter 2000's permanent database.
- rouperm - the configurator program which is used to modify the permanent database.
- rouperm_help.txt - the HELP file for the configurator program.

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Did you find errors in this manual? If so, please specify the error(s) and page number(s).

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